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Please Mention Earth Science Digest

Cover Photo

This month's cover photo was taken by Mr. and Mrs. G. S. Hinton of Houston, Texas. Subject of the photo is the Rio Grande river where it passes through the Edwards limestone fault between the U. S. and Mexico. The left hand side of the picture is in Mexico and the formations on the right hand are in Texas.

Very few people are lucky enough to see this great sight. It is almost totally inaccessible. The spot is 100 miles from the nearest highway. The terrain immediately surronding the fault is extremely wild. Mountain lions and snakes are the most common inhabitants.

This picture was chosen from the 23 entries in the November contest. A check for five dollars has been sent to Mr. and Mrs. Hinton.

Z



A row of three craters at the Craters of The Moon National Monument.

Craters of the Moon

Henry N. Andrews, Jr.

Since February of 1943 the Paricutin volcano in Mexico has received a generous measure of publicity from the popular and scientific press. Scores of geologists have taken the unparalleled opportunity of observing the birth of this fire-mountain south of the border. It has contributed a food deal to our knowledge of such phenomena, but it is not necessary to go quite so far away to see an excellent display of volcanics. To anyone with the slightest interest in geology the Craters of the Moon National Monument in Idaho presents a display of volcanic cones, lava flows, and all their attendant phenomena that is unequalled in the United States. Unlike the volcanic displays of the Yellowstone, the Craters of the Moon lack the active hot springs and geysers, as well as the surrounding forested hills and lakes which lend much color and charm to that nearby corner of Wyoming. The two areas are, however, so different as to be in no sense competitive as far as general geological interest is concerned.

Probably the position of the Monument, in south-central Idaho, somewhat off the heavily traveled east-west highways accounts for the fact it is not as well known as it deserves. And, for a number of reasons which will be pointed out, it cannot have the appeal to the average tourist that is offered by Teton, Yellowstone, and G'acier Parks. But to the amateur or pro-



Rough Lava Flow.

fessional geologist let me voice with enthusiasm that it is worth going hundreds of miles out of your way.

Highway U. S. 20 (Idaho 93A) which runs from Shoshone to Blackfoot passes through the northwestern corner of the Monument and although overnight accommodations are not abundant between these two points there are comfortable cabins, as well as camping facilities, near the entrance.

The Monument area, some 80 square miles in extent, is surrounded by sagebrush desert, hot and decidedly uninviting in summer and equally cold in the winter. And because it is a barren region of light rainfall there has been only imperceptible erosion of the most recent lava flows.

An automobile road extends

about three miles into the Monument from the entrance and from the extreme south end of this some of the most spectacular features in the area are to be seen. Immediately to the northwest of the road is a series of three craters. To the southeast there extend a row of spatter cones surrounded by lava flows, while a few hundred yards to the east is Inferno Cone, one of the many cinder cones found in this immediate region.

The spatter cones, although relatively small, are more irresistably fascinating than any other single feature in the Monument. Those near the road rise somewhat less than 50 feet above the surrounding lava field and one may readily climb to their tops and gaze down into their dark cavernous mouths. The spatter cones differ from the larger cinder cones by virtue of the much coarser clots of lava that were hurled out to build up their sides.

Even a casual observation of the cinder cones, with their smooth sides composed of uniformly fine cinders, reveals a good deal about the time element involved in the development of the area as a whole. Some of the cones are quite, or nearly, devoid of any vegetation indicating an origin sufficiently recent such that sufficient soil has not had chance to form, enabling plants to invade them. On older cones the low growing bitterroot and buckwheat are scattered uniformly over their sides; while on still more ancient cones a variety of shrubs including sagebrush, chokecherry, and rabbit brush, as well as limber rine thrive under what appear at first glance to be impossible growing conditions.

However, the amount of vegetation on these cones does not in itself give us an accurate indication of their age. Depending largely on the climatic conditions, regions that have been thus devastated may be clothed in a new cover of vegatation in a very few years - or it may be many decades before plants are able to make much headway at all. The aridity of this part of Idaho, combined with a short growing season, effectively prevents any rapid invasion of new vegetation. A striking contrast in this respect may be drawn between the Craters area and the famous volcano of Krakatau. In the summer of 1883 more than four cubic miles of this tropical isle lying in the Sunda Strait between Java and Sumatra blew skyward in one of the greatest earth convulsions in recorded history. The explosion was heard in Cevlon and Australia and volcanic dust was distributed all over the globe. Ashes and glowing stones

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destroyed every vestige of plant life on Krakatau yet in a little more than 20 years a considerable forest had sprung up on the devasta.ed island.

The Craters of the Moon, moreover, is not an area of violent activity such as Krakatau, Vesuvius, or the volcanos of Hawaii. During their most active periods we could probably approached within a few hundred yards of the cones at the Craters Monument.



Pahoehoe Lava.

The great lava flows may be explored in all directions above ground - and in a few places below. They consist of two rather distinct types: the extremely jagged "aa" flows over which one can walk safely only with the greatest care, and the more interesting "pahoehoe" lava. The latter presents the general aspects of a sea of fudge that has been frozen in its last viscous boiling stage before being poured into a buttered pan! The crust is relatively smooth and billowy with occasional streams of "rope lava" caused by the solidification of the crust while it was being carried along by the flowing molten lava beneath.

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Entrance to one of the many caves in the monument area.

Two striking bits of evidence bear out the fact that lava rock is a poor conductor of heat. When these great streams were fluid rivers of molten rock the surface in certain places solidified while the lava flowed beneath, and especially near the sources it left great tube-shaped caves as the last of the lava poured away. Where the roofs of these tubes have caved in one can gain access to these winding caves with their snow banks and ice cold water. These lava tubes vary in size from ones a few inches in diameter to others much larger than a city subway "tube". The splendid Indian Tunnel, located about onehalf mile from the auto road should not be missed. The pools of icy water, resulting from the melted snows of winter, further attest to the poor heat conductivity of the lava even under the intense heat of the summer sun. The author is one who enjoys a hot shower after a day's work in the field - or a mountain stream or lake: even the milky glacial brooks of Glacier Park have been relished on occasion — but the cold shower bath at the Craters campground takes all prizes for a close approximation to absolute zero - it is not recommended!

One cannot help but wonder when viewing this fine display of such seemingly recent volcanic activity just when the last eruption took place - and, indeed, when future ones may be expected. In a very informative "Guide to the Craters of the Moon National Monument" Dr. Harold T. Stearns presents evidence that the last eruption in the area was not less than 250 years ago nor more than 1.000. And with reference to the futrue he notes that "It seems safe to predict that another eruption may occur in this area in the not too far distant future."



Rock Shop of the Month

On December 5, 1944, A. L. Jarvis of Watsonville, California opened his mineral store for business. Since then the Jarvis firm has been one of the more progressive firms in the mineral and gem cutting field.

Mr. Jarvis has long had mineral collecting for a hobby. Formerly of Dallas, Texas, Mr. Jarvis moved to Watsonville in September of 1944. His specialty is lapidary work and materials. The Jarvis store is agent for Highland Park Equipment, Felker Saws, Fluorescent Lamps, etc. They stock books, mineral specimens, polishing compounds, buffs, and other materials that might be of interest to the col'ector and lapadist.

Collectors and cutters who desire to contact Mr. Jarvis should address correspondence to: A. L. Jarvis, Rt. 2, Box 350, Watsonville, California.

Famous Mineral Localities Renfrew County, Ontario, Canada By Jerome M. Eisenberg

Mineral specimens from Renfrew County occupy a predominant place in mineral collections the world over. Although the apatite, corundum, totanite, and zircon are most famous, over 35 other species occur plentifully in this mineral collector's mecca. A great many of the mineral occurrences were worked solely for obtaining museum specimens.

The heart of Renfrew county is situated about 70 miles west of Ottawa, Ontario, and about 180 miles N. E. of Toronto, Ontario, as the crow flies. Renfrew is easily accessible by railway (the Canadian National and Canadian Pacific) and highway (provincial highways Nos. 17, 41, 60, and 62).

The bed rock of the country is Pre-Cambrian in age, except for a number of infaulted outliers of Paleozoic limestone. The geolegy of the county is treated thoroughly in Satterly's report of the Renfrew Area. (See References).

APATITE is found in excellent reddish-brown, and more rarely green, crystals, the more important localities being at Eganville, Ross, and Sebastopol townships. This mineral usually occurs in calcite veins, associating with hornblende, pyroxene, scapolite, titanite, and The calcite is commonly zircon. salmon-orange in color, sometimes fading to a pale pink. At the Ellioets Mine in Ross there is an outstanding occurrence of apatite with scapolite and titanite crystals. The Park Mine in Sebastopol turned out apatites up to one foot in length. On Turners Island, Lake Clear, Sebastopol, are found some of the most magnificent apatites in Renfrew, one of the crystals weighing 700 pounds.

About 1880 a number of deposits were worked for about three years, totaling about 2,000 tons of apatite. It was about this time that Renfrew first became noted for its fine mineral specimens.

CORUNDUM occurs plentifully in western Renfrew county. The crystals are usually barrel-shaped and are brown in color. The most imcortant source of this mineral is at Raglan, especially at the Craig Mine, which has been responsible for more than 80% of the Canadian production of corundum. The crystals range in size from 1/4" to 3" across, although crystals have been found up to 4 pounds in weight, and some weighing up to 60 pounds have been reported! Garnet is usually found as an accessory mineral. Corundum also occurs in quantity at Brudenell, Radcliffs, and Sebastopol.

GRAPHITE occurs in disseminated flakes in gneiss or crystalline limestone in many localities in Renfrew. The Black Donald Mine at Brougham is the largest deposit in Canada, and it is also the only producer. The graphite occurs with diopside, mica, quartz, scapolite, and tremolite in the limestone.

MOLYBDENITE also occurs at a number of localities, chiefly at Bagot, Brougham, Lyndoch, Raglan, and Ross, being commonly associated with purite, pyrrhotite, pyroxene, and quartz.

Among the rare-element minerals found in Renfrew, the euxenite group occur most frequently. Lyndochite, a variety of euxenitepolycrase high in Ca and Th and low in U, occurs at Lyndoch, for masses, and rarely crystals. At Lyndoch, columbite and monazite can be found in crystals up to severinches in length, occurring in red microcline. Cyrtolite also occurs with these minerals, all of which are found in a beryl-bearing pegmatite.

TITANITE occurs as large dark brown crystals at Eganville, Ross, and Set astopol, often translucent, and is especially plentiful in the large masses of pyroxene at the Elliott's Mine at Ross.

ZIRCON is common as an accessory mineral in Renfrew, usually occurring with hornblende, calcite feldspar, and apatite. Very large crystals, some almost a foot in diameter, have been found at a number of localities, notably at Turners Island, Sebastopol, and Brudenell. In a band of limestone at the Smart Mine, Sebastopol, brilliant hyacinth-red crystals occur with the apatite and titanite.

Other minerals occurring commonly in Renfrew county are: actinolite, albite, biotite, celestite, chalcopyrite, chlorite, dolomite, fluorite, galena, gold, hematite, limorite, magnetite, nephelite, oligoclase, phlogopite, serpentine, sphalerite, spinel, talc, tourmaline, and vesuvianite.

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Lapidary Equipment Co. Purchases

New Seattle Location

After November 1st, the new address of the Lapidary Equipment Company of Seattle will be 1545 W. 49th Street, just two blocks north and 1 block west of the Ballard Bridge.

According to K. J. Hillquist, president of the company, the purchase of the new building will enable Lapidary Equipment Co. to consolidate both their retail store and manufacturing plant in one location. Extensive modernization and development plans are under way for the new building, and the move is hailed as a major advance in the progress of the company.

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An Alaskan Gold Deposit

By Victor Shaw

THERE IS an old saying, "gold is where you find it"; which in many trail-making journeys into wilderness regions, we have found true up to a certain point. That is to say, the concept is factual so far as rock hounds of a half century ago are concerned; but does not apply to prospectors of today, who are technically trained, have practical field experience, and who use modern scientific instruments.

There is little guesswork involved in modern prospecting.

An angle of the old-time methods is shown in the following narrative: an incident that happened during the Stampede of '98, on Cleveland Peninsula in Southeastern Alaska. Specifically, it was the chance discovery by this writer of an outcrop of exceptionally rich gold ore; in fact, the surface ore had so much free gold that, along its apex and for fifteen to twenty feet of depth, there often occurred many sizable slabs and sheets of pure solid bullion, without any gangue

The discovery was made in an area then practically unknown and unexplored, and it had never been geologically surveyed and mapped. This account is offered to show how this deposit was found, what was done with it, how problems entailed were solved, and the final result. But for clear comprehension, it may interest readers of Earth Science Digest to first picture the locale and outline geologic features.

SPEAKING generally; it is surprising that a majority of our American public still have but a vague idea of how rich in potential resources is their newest possession, the Territory of Alaska. They've read or heard that it is a land of fur, fish, timber, and gold — but also there is a fixed belief — fostered by the "movies", that it is all an arctic land of snow and sub-zero cold, where travel is by dog sledge and you always dress in parka and muckluks to avoid freezing.

The truth is that all coastal Alaska is relatively warm, being tempered by the north arm of the Japan current; in fact, the average annual temperature of S. E. Alaska is one degree higher than that of Virginia. This is true up to Cook Inlet and southwest along the Aleutian Island chain; a few realize that Kiska Island is so far south that the 52 degree parallel of north latitude runs through its center. In other words, Kiska is as far south as Lancastershire, Eng. and almost as far south as Vancouver, B. C. The baffling fog of our Aleutian outposts is the result of the Bering cold air mass meeting warm Japan air masses.

Another misconception is that Alaska gold is practically exausted, its mines mostly worked out like its big Kennecott copper mine. Acually it remains a vast treasure vault, with mineral wealth hardly scratched. Just prior to War II, the U. S. Geological Survey reported only 47% of its nearly 600,000 square miles was surveyed geologically, this due wholly to a lack of government appropriations for the purpose.

The point here is that Alaska is highly mineralized throughout, from Hyder to Barrow and from Forty Mile to Nome. Naturally, barren areas lie scattered here and there, as in all mineralized regions, but most of it has plenty yet untouched. Mines that have been worked for years still have large reserves, like the Hammon placer of Nome having estimated reserve gravels that will take five dredges more than 50 years to exhaust. And as for the unexplored regions, Alaska, which for the most part was passed by, when the gold-mad hordes hurdled the White Pass to be first at the dripping Klondike honey pot.

All of southeastern Alaska is rugged and mountainous, with a coast line that resembles that of Norway and western Greenland, being similarly indented by a fringe of numerous fiords large and small. Its coast range is a northern extension of the Vancouver Island Range, B. C. The Rockies lie inland; but in British Columbia, between its coastal mountains and the Vancouver Range lies a "submerged trough due to the down-folding of the coast batholith", which extends on up into Alaska.

The dominating feature of Southeastern Alaska is the cordillera bordering the mainland, (and the extension of the B. C. "trough" forming the "Inland Passage") with peaks rising to 6000 and 8000 feet. Its Coast Range follows along the mainland for some 900 miles, passes behind Mount St. Elias decreasing in height and merging with the inland plateau near Lake Kluane, in northwestern British Columbia.

The "down-warped trough" appears to end at Chatham Strait, and this strait and its extension Lynn Canal comprise an immense fiord eroded along a giant faulted zone; which is 250 miles long, 3 to 6 miles wide, and 1,000 to 2,900 feet deep. Tertiary rocks are exposed along both trough and fiord, in or bordering them where not wholly submerged. The bedrock geology of the section including the Cleveland Peninsula, with which we are concerned, comprises the composite Coast Range batholith and associated outlying western intrusive areas: a complex metamorphic belt contacting the mainland batholithic igneous rocks.

This belt is mineralized with injection gneiss, crystalline schist, phyllite, limestone, and a very schistose greenstone. Also included are three belts of Mesozoic formations. In addition, there are Paleozoic rocks, which occupy about twothirds of the Alexander Archipelago — off-shore islands — and also extend northward to Glacier Bay. The metamorphic complex is partly Carboniferous, but includes beds ranging from Ordovician to Upper Jurassic, or Lower Cretaceous ages. Lava flows are known on Kruzof Island, Thorne Arm in S. W. Revillagigedo Island, and at Lava Fork of Unuk River north of Burroughs Bay. All these latter areas are outlying territory around Cleveland Peninsula.

The bordering Tertiary strip mentioned above forms the lowland portions of Cleveland Peninsula, especially around Union Bay on its western flank; and is extends northwest and southeast also for a long distance on the east side of Clarence Strait.

Its rock formations comprise Mesozoic and Paleozoic sediments of metamorphic type intruded by volcanics, and Cleveland Peninsula has two notable intrusive mountains of the ultrabasic rock types. In detail: the sedimentaries include slate, greenstone, graywack, phyllite, crystalline schist, mica schist, shale, gneiss, limestone. The intrusives are chiefly granodiorite, some granite, hornblendite, gabbro and gabbro-diorite and ultrabasic dunite, pyroxenite, peridotite, with same areas of titaniferous magnetite lying east of Union Bay.

These formations are here most favorable for deposition of commercial ores including gold; and an ultrabasic stock forms a mount intruding mixed sediments of greenstone and slate, in the area of the rich discovery on which this narrative is based. Nothing of this was known to the two amateur prospectors, who had staked several vein out-crops on this promising contact the summer before our arrival there. It was blind chance that led them to stumble over those streaks of quartz specked with a few tiny dots of gold. They knew gold when they saw it, and the slate "countryrock". That was all. That nearby intrusive stock was just another mountain. The contacting slate meant nothing.

But one partner had selected a bunch of nice looking samples, and taken a steamer to Seattle that fall to raise some mining capital. All he got was promises, if development showed fair improvement; but it was some of those samples, seen in the Hotel Seattle next February, that lured us there the following spring — our readers may recall.

And thus we steamed north on the old COTTAGE CITY, in company with this partner, Cap Dyer; a lean man of middle age. who had agreed to show us his property, as he was going up anyway to work on it. His title we learned had been gained while master of a Puget Sound tug boat. We wanted to examine his claims, to get a line on the local formation.

After landing at the port of call nearest the Dyer property, having talked things over on the way north and agreed to camp together while outfitting; we located a vacant log shack, abandoned by an Indian family, which we preempted, cleaned up, then moved in and got settled. This done, we bought a sealing boat with sail and oars — no power craft those days — and decided on a short exploring expedition.

As this gives a side light on the mineralization of that region this little sortie may have some interest. Our base cabin was on a bluff overlooking the steamer route on the "Inside Passage", which at this point was quite narrow, being only 1,000 water yards over to an island of some size. It didn't take long to . row across and land upon a pebbly, sloping beach where we hauled the boat high and started inland across a grassy flat that rose gradually toward distant mountains.

Presently we came to a small creek about four feet wide that had its source in those inland hills. The creek was eroded deeply, like a ditch, its bed being some three feet below surface, so we jumped it. The day was clear, with a bright sun, and while in mid-air split vision caught a flash from the creek bed which, after landing, we went back to investigate, finding under a few inches of water a chunk of quartz the size of a walnut that was speckled all over with shining gold.

To be able to find such "float" in less than an hour's travel from a settlement and on the first day out raised our opinion of this district to a high pitch. It is this point we stress, dismissing what followed in a word: that we tried to trace the float to its source and failed. Later, we learned that there was a likely gold prospect a few miles south, also quite a few promising gold claims were being worked on the mainland, not far from the Indian trading post where we'd landed and located our base camp.

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Gem Wood of Kansas and Colorado By Allen Graffham Ottawa, Kansas



In some geologic formations of eastern Colorado a fine quality fossil wood occurs. Quantities of this material was picked up by the streams flowing eastward from the Rockies and carried into Kansas. The exact locality from which the wood came is not known but specimens from the vicinity of Denver have the appearance of coming from the same formation, at least.

A more unassuming rock can hardly be encountered in the field. The patinied exterior weathers a dirty yellow and the resemblance to wood is the only interesting feature seen at first glance. Break off a chip and wet the exposed surface or saw off a slab and you can quickly see why this is the finest fossil wood found in Kansas. The Jasperized portions vary in color from black to brown, various shades of yellow and red. Through this run numerous cracks and cavaties of various sizes which are filled with chalcedony. This chalcedony is either water clear, light brown, or pinkish. Occasionally red, white

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THE CHICAGO ROCKS AND MINERALS SOCIETY held their first auction at the Sauganash Field House on November 9th. There was a good crowd in spite of the heavy rain during the evening. Our members and friends made generous donations of material which covered both sides of five eight - foot tables. In addition there were three raffles and a door prize. The monetary return was extremely satisfactory.

Our very capable member, Mrs. Marie Holtz, not only gave an interesting lecture on the geysers of Yellowstone illustrated with colored slides but she also headed the refreshment committee. In both the lecture and the refreshments she was ably assisted by Mr. Holtz.

There was much visiting with old friends and getting acquainted with new ones. There was a general departure about 11 o'clock, everyone being laden with bargains.

> George Anderson, President

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THE COLORADO GEM CO. Bayfield, Colo.



Colorado Gem Company at Gem Village.

Gem Village

The First and Only Gem Colony in the U. S.

In southwestern Colorado, eighteen miles east of Durango and two miles west of Bayfield on U.S. 160 is located America's only gem colonv. Situated near the corner where Colorado joins New Mexico, Arizona, and Utah the colony is within a day's drive of some of the most important gem collecting locales. Although it is only a few years old, gem cutters, mineral collectors, and dealers are already moving to the colony. Buildings are going up and as soon as the material shortage is relaxed the colony will reach it's full development.

The idea of the gem colony was conceived by Frank and Grace Morse. They spent several years selecting a sight for the colony. Finally, after considering innumerable locales, they decided on a spot just two miles west of Bayfield, Colorado. It is truly a wonderful location for a rockhound colony. The altitude is 6,500 feet, the climate is dry and there is always plenty of sunshine. Winters are mild and the summers cool. Hayfever and sinus sufferers find the clean mountain air gives them relief they can't find in lower altitudes.

The colony lies in a valley running north and south. Lots have been plotted on both sides of the highway for one-half mile. The lots are 100 by 300 feet and are currently selling for \$150. Of the forty-six original lots that were offered for sale, there are only about a dozen left. These will probably be sold before the first of the year.

Mr. Morse has donated land to the colony for a park and a reservoir. A combination museum and exhibition hall will be constructed in the not too far distant future.

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Branham's Specials

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Jig-Saw Giants By Oscar A. Anderson

An American colonial governor was perfectly of the opinion that a six-inch fossil tooth came from a human giant. In the absence of knowledge about mastadons, that was a natural conclusion. People had always believed in giants. It's like racial memory. Because of such belief, Americans spent a fortune to see the "petrified" Cardiff giant. No tale could be too tall about giants of yore. Most everybody believed — except the hardheaded, tough-minded, skeptical men of modern science.

Instead of jumping at conclusions, scientific fossil hunters have been patiently working on an immense jig-saw puzzle, trying to piece together the history of early man. The pieces of the puzzle are jaw bones, skull caps, femurs, teeth, which are scattered and hidden around the earth. Slowly and painstakingly, enough pieces have been assembled so that a fairly large picture of man's family tree has taken form. Quite a few ancestral relatives can be discerned. These include the Java, Peking, Eyassi, Piltdown, Heidelberg, Neantherthal, Rhodesia, Solo, and Cro-Magnon men. But we have no full-length figures of these men nothing complete like the American pseudo fossil-giant who had a full quota of arms, legs, ears, and even minute details such as pores in the skin.

The Peking man, for instanct was personified on the basis of a single tooth which had been found in cave deposits. The missing man, who had absented himself from the tooth, was given the formal title, Sinanthropus pekinensis. At later date, skull parts and more teeth were found, which fully verified the genus. It took over ten years of purposeful effort at one site in China to make that much headway with this one portion of a worldwide jig-saw puzzle. And it took over forty years before the famous Java man, Pithecanthropus after the fragments of him had been discovered. Such are the slow-going, monotonous difficulties in constructing a comprehensive picture of mankind's family tree.

But after many years of patient piecing of perpiexing parts of the puzzle picture, we now have drama. The scientists are chattering about giants! They have joined hands with the Israelites who had told of early times when "There were giants in the earth in those days." And in addition to their own belief in giants, the men of science are turning theories of evolution topsy turvy. Mental revolution is in the air.

As a tale about dry bones, this is getting to be a toothsome story. Ordinarily you'd associate huge, lone, dreaded giants with great and mountains. A fitting burial place would be the Grand Canyon, or a large room in the Carlsbad Caverns. But fate is no respector of persons and plays many pranks. The first ancient giant to be discovered and identified was in a Hong Kong drug store!

Fossil hunters will search everywhere for the rare pieces needed for their jig-saw puzzles. They dig into river banks, tear up ancient lake beds, prowl over mountains, and throw out accumulated floors of caves. Such a hunter snooped through Hong Kong drug stores.

To page 26

SLICED GEM MATERIAL

For November we are featuring sliced Agate from four states. Petrified woods from two states and Novaculite, which is a form of colored and blended quartz. Every price of choice quality.

> 12 sq. inches assorted, \$2.00 25 sq. inches assorted, \$3.50 50 sq. inches assorted, \$6.00

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500 Costume Jewelry Stones, \$2.00.
B. LOWE, Holland Bldg., St. Louis, Mo.

AN ALASKAN GOLD DEPOSIT From page 11

At any rate, it was with much enthusiasm that presently we assembled an outfit, set out with Cap Dyer to visit his property, and then to start prospecting what seemed to be a most favorable region.

So, in high spirits after a long day's sail, we arrived at the site of the Dver claims lying on the west side of a 6-mile bay, where we met Cap's partner, Johnson, who was a squawman. Johnson had been "sitting on the claims" during Cap's absence in Seattle. The claims did not cover a solid block of ground. but were in the form of a very loose network, each being staked on separate outcrops leaving much open land between, many of these an acre or more in size.

They had found the first of these veins by sheer accident, as it was four feet of white quartz plainly visible where it cropped out on the beach and ran into salt water. The rest of the network of course was easily discovered, all with more or less gold in sight; but so far as we noticed later, no work had been done on any of them, yet.

In early morning, of the day following our arrival, we set out with Dyer to inspect an outlying portion of his claim-group, our own partner being out after deer for meat in the pot. When starting on this trip, Dyer had suggested taking to the stream flowing through the group of claims, as it afforded easier hiking than through the brush.

The sky was cloudless, with a brilliant sun shining at intervals through chance openings in the canopy of foliage shading the creek. As it happened to be an unusually dry summer for that region, the

THE EARTH SCIENCE DIGEST

stream was low and clear, its bottom rocks and pebbles plain to see. So we waded in high-topped boots up the left side of the sizeable stream, Cap Dyer taking the opposite side on the right.

From habit, we worked upstream slowly through the shallow water about three or four feet from shore, intently scanning the bottom gravels for float fragments, not only possible gold ore but in particular samples of country rock, to identify the local rock formations. As always, this was fascinating business and delayed us to the extent that Dyer progressed more rapidly and was some distance ahead.

And presently it happened! At our feet under about 6 inches of water, there came a bright flash of shining yellow metal and, darting a hand under water, we tried to pick up the chunk of float ore. But it resisted. We couldn't stir it, so we dug up the pocket knife to test that shining metal surface; which was imbedded on a rock and showed a flat water-worn surface about a quarter inch wide and a half inch long. One jab of the knife point was enough. It was gold, beyond a doubt.

Question: was it matrixed in a buried fragment of vein gangue, or could it be ore-in-place? Followed a careful probing and digging with knife blade and fingers, which soon proved the latter was a fact! We had found the apex of what seemed a rather rich gold vein, or lode! And here a few facts must be cited, to explain what happened:

First, having some field experience, we weren't overly excited by this discovery; more especially because, lacking a claim map, we couldn't know whether this vein was on a Dyer-Johnson claim. or was in one of the open spaces in



his group some of which lay wholly separate. We were roughly inside the outer perimeter of the group, but even so if this vein was on open ground we could stake a legal claim on it.

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AN ALASKAN GOLD DEPOSIT From page 19

However, if it chanced to be on a Dyer-Johnson claim, all we had to do was mark the site of the vein and wait awhi.e; then propose to take over one of the group and develop it on a royalty basis instead of rambling off over the strange country hoping to make a strike. Had we followed this logic and chosen this vein, well

Instead, we strightened and shouted at Dyer, who then was out of sight around a creek bend. When he appeared, we yelled:

"Hey, Cap, come back and get an eveful of this!"

He hustled back, stared at the glint of metal, pawed around both sides of it like a dog at a gopher hole, and went hog wild. We traced that vein which wasn't very wide, nor needed to be, found that it angled into the left bank and into the forest, to where it entered the face of ledge of upthrust greenstone about head-high.

About waist-high in its face was a cavity, or vug, where the vein widened to about eight inches, the opening being about a foot in height and penetrated the ledge for eight or ten inches. Its bottom was basin shaped and level full of dry, fine silt. Dyer had gone to the other side of the ledge to trace the vein farther, and we studied this cavity and the vein gangue in place above it. The vein filling was not quartz, but calcite, which quickly weathers to a fine powder; so, we poked an inquiring finger into the bottom s'it in the cavity, then called to Dyer: "Oh, Cap! Got a gold pan in camp?"

Dyer poked his head over the ledge and stared, frowning.

"Sure have, Sport, at the shack. Whatcha want of it?"

"Why, this vein is all calcite and no quartz. It's weathered out to make this hole, and if there's any gold here there'll be some in the dried mud in the bottom here. How about getting your pan, eh?"

He got us, all right, and hiked down the half mile to his log cabin on the bay shore. When he returned with the pan, we put a double handful of the silt in it and panned it down in the creek. There was little waste stuff, and after combing off the nuggets shaken to the top, some pea size, some big as a thumb, we finally swirled a string of the remaining flour gold a quarter inch wide halfway around the pan. This and two more pansful, a double handful in each, cleaned the hole with each pan getting even richer. We estimated they ran over \$100 a pan, and from merely being "wild", Cap then went plumb loco; and no wonder, for we later learned that before leaving our base camp, he had broken his last remaining fivedollar bill. But, here was plenty more!

That's what **he** thought. Oh, it was a "strike", surely, always providing the vein was of reasonable extent, was a fissure and not a gash vein having little depth, and that this wasn't a chance pocket. And, while Cap panned sand and gravel scraped up along the outcrop, we studied local topography and combined it with the rock float we'd identified while coming up the stream. And much of this could only be proved by development.

Meanwhile, it looked like this was a proper contact of metamorphic sedimentary slate and schistose greenstone intruded by the igneous nearby mountain. The mountain probably wasn't granite, or diorite, as we'd found no such float; but we had found fragments of what seemed to be an olivene rock like dunite, and the color of some cliffs up near the hill summit checked with this possibility of an ultrabasic intrusive. Further, the vein showing in the ledge face here seemed to be of true fissure type; in which case, it would doubtless widen with depth, thereby losing a lot of this high grade ore, but retaining plenty to at least make a small milling proposition feasible.

This stream, which headed in an island lake in the back hills, would supply cheap power and the bay was deep enough for freight steamers to load concentrates docked at a long pier, or possibly by using a short tramway. All in all, it did look like a small paying mine. **But**, what chiefly concerned us was whether this formation was purely local, or, as we fondly hoped, it perhaps extended farther along this coast, as we must move on shortly and get about our own prospecting.

AND HERE, the usual prospecting story might end with the successful discovery of this wonderfully rich ore deposit. In fact, our readers may expect it to end here; but this differs a bit from the runof-mine tales, since it has a sequel which may have additional interest, by showing what can happen to even a rich outcrop — and often does.

Anyway, leaving the beaming prospective millionaires — who incidentally abandoned their other claims and confined work to this one — we wished them luck and sailed up the coast on our own venture; which has no bearing on this tale, except that we saw a lot of fine country, had plenty of really super hunting and fishing — and staked no claims.

RETURNING — a month or so later and being much interested in the new discovery, we landed at the Dyer-Johnson camp to learn what a little mining might have developed in our absence. The base cabin was quiet, with no one in evidence but the fat jolly spouse of the squawman. Inquiring for her man, we were met without the usual smile, and were dourly directed to the mine and left puzzled by her long face.

Upon reaching the scene of the big strike, we found the partners huddled on a side dump staring gloomily into an open trench, about twenty-five feet long and ten feet deep, where the vein had been. And neither stirred at our greeting, except to turn a sour glance our way. Squatting beside them, we asked what gave. Dyer explained, fully.

It seemed that, after diverting the creek by a curving ditch, they had mined straight down on the vein at the point of our discovery, and along it as far as the projecting ledge which they blasted out. At first it had looked like they had Lady Luck by the foretop, with a down hill drag. A day's labor had filled two big water pails with ore, that was packed down to the cabin. After supper they'd sit before two big thick slabs of slate, each with a pail of ore, and hammer the chunks of ore which were so heavy with gold that the calcite gangue powdered and the gold content was pounded into flat slugs of pure metal.

We later saw a ten-inch crockery fruit bowl heaped with these slugs, which must have been worth two or three thousand dollars. Anyway, these acid-cleaned, were then retorted to yield "retorts" of gold alloyed with some silver and impurities, but salable at the U. S. Assay Office in Seattle at \$14 or \$15 a Troy ounce before refining. A first shipment of about 120 ounces brought nearly \$2,000, and the yield up to date from this open cut titaled nearly \$25.000.

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They now had a deposit slip and check book showing this was all in a Seattle bank, Cap admitted; then ended his tale of woe with a blistering string of profanity and pointed at the open cut.

"And then the cussed vein petered out on us. Look at it!"

Full of curiosity, we slid down into what at first glance was just ditch cut through a solid mass of slate. The marvelous treasure vein had apparently taken French-leave, was gone, vanished, kaput. But a judicious prodding and scraping at the bottom revealed a very thin crevice, about wrapping paper thick. But, it was the vein, which had merely pinched at that point, doubtless due to outside pressures. The crushed and mashed structure of the slate on each side proved that.

"Looks like hell, don't it?" Cap growled from above. "Don't hardly know what to do with 'er, now, after we talked 'er over all day. Look here, Sport," he added, as we stretched up a hand and was hauled up beside him, "what 'd ya do if you was us? Got any ideas?"

"What did you fellows plan?" we countered, with much interest.

"We-el," he scratched his head and frowned, "we don't rightly know. All we could figger out is drop to near the bayshore, and drive a tunnel in under here and see if she goes down. Whadda you think?"

"Cost you more than you took You forget the slope-angle to the out," we grinned. "A lot more! it's that, and it's about two claims beach is only about 12 degrees, if distant — three thousand feet. So, you'd hardly get fifty feet of depth here, under the outcrop. Get it?"

"Guess you're right," both nodded. "But, what's the answer?"

"Follow your ore," we suggested. "Sink a small shaft on this crevice in the bottom there. That's your vein, and it shows on both walls that it was just pinched here. Some veins have the ore in lense shape a series of them, with pinched places between. I'll bet plenty by the time your shaft is a dozen feet down, you find the vein widened. And ...," we pointed out, as they exchanged grins of pleased comprehension," if it opens up again and I think it will, for the love of Pete don't mine out all the ore!" And, as they stared blankly, "leave it looking good, with plenty of the rich stuff showing everywhere, and hunt a buyer and sell it. You'll be money ahead, if you do."

"Sell!" Cap yelled. "Man, she's a bank — take all you want."

"Ever hear of banks going bust? Do you think this rich stuff will keep on down as far as you can sink?" This heavy gold is surface ore, secondary enrichment it's called — like cream on a pan of milk, and sooner or later below it will change to a milling ore, which takes plenty of capital to handle and engineering skill to install. That's why I think your best bet is to sell, and let the other guy run the risks — a man that's made mining his business and has the know-how.

"And if you sell it, don't for heaven's sake set the price too high. Rich as it is, this is only a prospect. Only a proved property in steady production, with big reserves blocked out is worth big cash. Too many risks to a prospect like this, and buyers know it too well. So take what they offer and consider yourselves lucky. With that and what you have and can still take out, you'll win. Not otherwise." **APPARENTLY**, they got the idea and perhaps some of the implications involved; at least, they agreed that it sounded reasonable and they'd think it over. However, in the end, natural human cupidity and we all have more or less—stepped in to snarl up results and leave them frustrated. Though, even now, you may hear stories up there of how the Johnson kids used to roll gold eagles over the floor in play.

At that time, after we left them to work out their problems, they put down the shaft and the vein opened to its former width and ore So they again began to values. mine and ship retorts. Also, they built a Spanish arrastre to handle the auriferous tailings, as we had suggested before leaving, which utilized the water piped down from the lake not far back in the hills. Roughly, this comprised a water wheel mounted side-down to turn on a vertical shafting, so that a twoinch pipe nozzle played a powerful stream of water on the paddles set into its perimeter. Its heavy and well-braced spokes thus dragged four big rocks with flat bases around the circular concrete floor of the cemented rock-walled enclosure, thus grinding tailings into a pulp having a quantity of mercury to catch the released flour gold. This pulp was then run through a sluice, and the residue on the arrastre bottom washed up and panned, all of which added much to the total gold recovery. In fact, we heard of one clean-up of \$5,000 from this arrastre.

Thus they continued mining that summer and into the fall, until stopped by winter snows and low temperatures; and resumed operations next spring, for the vein held its normal width and the high grade ore showed little if any decrease in value. We had reports of all this at intervals from different sources(but no rumors of a proposed sale.

Meanwhile, news of this exceptional deposit and its steady bullion shipments had locally become well known; also, it had sifted down to Seattle, to be reported in the Post Intelligencer news sheet. Thus it attracted the attention of an agent of the British Venture Company in the city, who sent scouts north to investigate this new mine.

By that time, we had staked several different groups of mine claims here and there, among them a promising quartz-gold lode and one rather heavy vein with chalcopyrite ore averaging over 5% copper, that we left in charge of our partner. But, we had wintered in San Francisco, then had gone east to join the Peary Relief Expedition of 1899, due to start for North Greenland the middle of that July. But our partner kept us informed on Alaska matters — and the Dyer-Johnson mine.

Thus we learned that Ventureengineers had visited, examined, and sampled the deposit with their usual meticulous care; that the findings had been so favorable that they offered the owners \$100,000 for that single claim, in cash with no strings attached. Added to what they'd mined, they had enough at interest for the rest of their lives.

But their raised sights overshot that mark, and they turned the offer down cold, stating that their lowest price was half a million, or no sale. Doubtless their steady shipments influenced the decision, thinking perhaps they'd easily take out that much in short order and still own the property. However, the Venture agents immediately threw up their hands and sailed south in disgust.

To page 31

THE EARTH SCIENCE DIGEST

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The finest quality **TIGER EYE** we have seen to date has arrived from Africa. **NOTICEABLY FREE OF PITS**, compact and dense, with a light golden color, this material is unexcelled as a gem stone. Priced at \$4.00 per pound. Sawed slabs are priced at 35c a square inch.

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Polished thunder egg halves, \$1.50 to \$3.00 per half.

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Montana Iris agate slabs about six square inches and nice row of dendrites on the lower edge for \$5.00 each, not polished. This is a fine buy.

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On Highway 97

Klamath Falls, Oregon

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JIG-SAW GIANTS From page 16

He pawed through collections of "dragon" teeth, a miscellaneous assortment derived from the tapir, stegodon, orang-utang and other animals. Among them were three gigantic teeth of human type! The finder, Dr. G. H. R. von Koenigswald, called the original owners of the teeth, Gigantopithecus. But in the light of other events, the name Gigantanthropus is preferably used because this applies more definitely to man.

More evidence of gigantic types were found in Java, which is a part of the home for ancient Sino-Malayan fauna of Southeast Asia. A fragment of a giant lower jaw containing several teeth was discovered. The owner was named, Meganthropus palaeojavanicus, "Big men of ancient Java". In addition, a massive skull cap and maxilla had been found. This owner was called Pithecanthropus robustus.

These China and Java over-size men proved to be very important, not only because they gave actual proof that there were giants "once upon a time", but because mankind's geneology could be traced farther back than ever — to somewhere around half a million years ago. Furthermore, a new form of evolution was seen, with one phase having waxed and waned, while another phase took a jump step in its progress.

Ancestors of Gigantanthropus are supposed to have had a straightline evolution such as horses and elephants which began with doglike size - and look at them now. The descendents of the mammoth man acquired more wit and brains, which made big brawn and brute force less necessary. So Meganthropus as part of the posterity became a lesser giant, while Pithecanthropus robustus was still less husky, till finally the size of our recent forefathers was reached. after which an upturn in stature and weight was made through better food and hygiene.

Of course, this is partly surmise. The first evidence of the giants has been slight. The whole Gigantanthropus clan is grimly hanging onto history with only three teeth. With a narrow escape from complete oblivian! And that is the tenaciousness which the fossil hunters have also. Give them the slightest clue and they'll dig and dig for more evidence. Now that there has been a glimpse of the giants, they'll be relentlessly purused over and under the surface of the earth until more significant facts are found. In that way the jig-saw picture is slowly completed.

DIRECT FROM THE MINE

ARAGONITE: Beautiful, unexcelled for bookends and novelties. Tough flawless — easy to work. Takes high polish. 15c a lb. Minimum order \$2.25. Also have those huge ARAGONITE PYRAMIDAL XLS. weibhinp up to 65 pounds: unknown to occur elsewhere. \$7.50 to \$20.00.

up to 65 pounds; unknown to occur elsewhere. \$7.50 to \$20.00. RED VARIEGATED JASPER: Very choice. Minimum 10 pounds. 50c per lb. WONDERSTONE: Exquisite colorings and markings Nothing more beautiful. M'nimum 10 pounds at 60c a pound.

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URANIUM: Torbernite and Autunite from a new Nev. discovery. You should know these precious minerals. Beautifully flourescent. **\$1.50, \$2.50** and **\$4.00, according to size.** Hundreds of choice duplicate mineral species from all over the world — not bought to sell. Prices will be right. My private collection is choice and extensive.

C. C. BOAK - TONOPAH, NEVADA

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We have been mining agates, jaspers, iris agate, and petrified wood for the last six months. This is all Arizona rock and is extra fine gem material, is very hard and takes a beautiful fine high lustrous polish that will last for years without scratching. Also makes beautiful specimens.

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NO PRICE LIST -

From now on I will have no price lists. Just send \$5.00, \$10.00, \$25.00 or any amount. Be sure to tell me just what you would like — agates, jaspers, or petrified wood, in the rough or sliced. We also have gem geodes coming from my agate mines. For large orders write for contract. Those wishing to be on mailing list write name and address.

APPOINTMENT -

Those wishing to contact me personally write or wire for appointment.

SPECIAL NOTE -

My stock of extra fine Arizona agates, jaspers and petrified wood is not very large so mail your orders in early. Orders will be filled at the mines on request for those wishing new fresh stock. This takes about 10 days longer.

SALE BARGAINS -

Ancient Pueblo Indians made arrow and spear points from beautiful agate and jasper chips from their old chipping grounds. These make beautiful gems for rings, bracelets, etc. These come in beautiful colors with moss, fern, flowers, pictures, etc. 10 mixed for \$3.00; 25 for \$5.00; 50 for \$8.00; 100 for \$15.00. Sawed ends of geodes, gem agate, jasper, petrified wood and others are 5 for \$6.00; 10 for \$10.00. 5 large slices of mixed gem \$8.00: 10 for \$15.00.

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1

Gem Wood of Kansas & Colorado

From page 12

and black banded agates of small size are found in cavaties in the wood.

This interesting gem material works up equally well into ring, bracelet, or pendant sets and also looks fine as a polished slab in a cabinet.

The area of outcrop from which this gem can be collected is along the valley of the Smoky River in Wallace, Logan, Gove, and Trego Counties in Kansas. Large deposits should be found in Colorado, but at the present time the author knows of only one dealer who has a quantity of this gem material and it is from the Kansas outcrops.

THE EARTH SCIENCE DIGEST



A group of fine specimens in the Frank Morse Collection.

> GEM VILLAGE From page 13

By the fall of '47 the majority of the buildings will be completed. A tourist camp is being included in the colony to accommodate visitors.

A rock show of national scope is being contemplated for next fall. Exhibitors and collectors will be invited from all over the U. S. It will undoubtedly be a big affair because the colony is more easily accessible to eastern collectors than some of the west coast sites. The first rock show was held last fall. This show had fifteen exhibitors and attracted over 200 visitors.

The colony is another example of the increasing interest in the earth sciences. Now that the calamitous World War II is over, too much stress cannot be placed on To page 30

Gem Village

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Mineral Quiz

- In what system does native iron crystallize? 1.
- 2. What is the mineral name for boric acid, B(OH)3?
- 3. Which two of the following minerals are not zeolites: apophyllite, heulandite, natrolite, pectolite, and scolectite? 4.
- What metal is contained in brookite?
- 5. What is the modern name for chalybite?
- 6. Does muscovite crystallize in the hexagonal, monoclinic, or orthorhombic system?
- 7. Which mineral has a higher specific gravity, witherite or cerussite?
- 8. Which of these minerals are not silicates? Glaucophane, spodumene, chrysoberyl, calamine, danburite.
- What is the hardness of zircon? 9.
- 10. What three crystal groups are represented in the amphibole group?

Mineral Quiz answers on page 31

GEM VILLAGE

From page 29

scientific study and research. Science is dependant on the amateur.

Particularly the earth sciences. No other scientific field has had as much backing by the amateur as has earth science. And no other field needs amateur backing as badly as does earth science. It's the amateur who pursues earth science just for the love of the subject that makes the majority of the important field discoveries. Members of the Gem Village rock colony will undoubtedly be future contributors to the science of Gemology, Mineralogy and Paleontology. In addition to the satisfaction they will have from lending their efforts to science, they will have the enjoyment of living in a community of people who share mutual interest in one of the most fascinating of all hobbies.



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Answers to Mineral Quiz

isometric. 2). sassolite. 3).
apaphyllite and pectolite. 4). titanium. 5). siderite. 6). monoclinic.
7). cerussite. 8). chrysoberyl.
9). 7.5. 10). Monoclinic, orthorhombic and triclinic.



AN ALASKAN GOLD DEPOSIT

From page 24

AND the misguided Dyer and Johnson blithely kept on mining, but the vein gradually kept on widening. After a while, almost imperceptibly at first, the per-ton value began to lessen; then more noticeably and they began to get uneasy, and then exceedingly anxious, since there was absolutely nothing they could do about it. Finally the vein grew so wide and the value so low that with the methods they employed the gold recovery at last failed to pay extraction costs. And as if Lady Luck laughed in her sleeve, not having kept up assessments on the original claims, they had lost them all when outsiders stepped in and re-staked every one of them. That did settle things, permanently.

With their mining in that district definitely over, they seemed to lose heart and did no more prospecting elsewhere. In the end, Dyer went the way of all flesh; but Johnson, after his wife was accidentally drowned, lived to a ripe old age. No doubt he often spun a tall yarn about once owning a million-dollar mine; privately kicking himself, however futilely, for not accepting that Venture offer.





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